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THE WILD ANIMALS OF BRITISH INDIA.

It has been too much the habit of English sportsmen in India, says a writer in a recent number of the 'Quarterly Review' (No. 333, July, 1888), to deplore the general decrease of the wild animals which they used to hunt. Wherever there has been a marked diminution or disappearance of the beasts of prey, it is usually due to one of three causes. The first and principal cause has been the gradual increase of cultivation throughout; the second cause is referable to the policy adopted by the Government of India, of giving pecuniary rewards for the extermination of wild animals and poisonous snakes; and the third cause is to be found in the assiduous endeavours of English sportsmen, during the last century, to kill as many wild beasts as they could find time and opportunity to destroy.

With regard to the first cause, it is a simple fact that the clearance of the forest and the spread of cultivation have been fatal, not only to the larger beasts of prey, but also to the innocent herds of Deer and Antelopes. Without entering into any discussion on the landed tenures of India, it is generally known that, however much the Government revenue systems may differ in each province, there is everywhere a similar amount of land-hunger among the cultivating classes. Wherever it has been possible to redeem a few acres of uncultivated land, the venturesome peasant has gone in, with his bill-hook and his plough, and has not hesitated to risk his life in protecting his



little crop from the ravages of the wild beasts, which had looked on the land as a part of their own domain.

The policy which has been pursued by the English Government, in attempting to exterminate wild beasts, leaves very little reason to fear that it will permit its new Game Law to be abused, so as to encourage the growth of any noxious animals. On the contrary, if, according to the old fable of Æsop, a council of wild beasts could now be held, it would be for the animals to complain that the English Government had encroached on their rights and privileges in a manner utterly unknown to the original rulers of India. They might plead, that there is no evidence that under any Hindoo or Mahomedan dynasty was there ever a fixed tariff of rewards for the destruction of Lions and Tigers, of Crocodiles and Snakes. They might admit that it was the practice of Oriental monarchs to make large collections of living wild animals in their menageries. The native potentates and their princesses and courtiers delighted in the fights of wild beasts; whether a Tiger was pitted against a Tiger, or a wild Buffalo fought against a Rhinoceros. The jungles were of course harried and netted to take alive the animals needed for the tyrants' pleasure. But with the English Government it has been made a systematic business to encourage the destruction of all wild beasts. A table of rewards, setting a value on the head of each Tiger and other dangerous animals hangs in every public office and market-place.

We shall now proceed to explain what has been the object of the Government operations and its system of rewards. In a recent number of the official 'Gazette' certain figured statements have been published with a resolution, recorded by the Viceroy of India on the 22nd November, 1887, reviewing the provincial returns, showing the measures adopted for the extermination of wild animals and poisonous Snakes in British India during the year 1886. The Government paid Rs. 189,006 in rewards for the destruction of wild animals and poisonous snakes collectively; but we shall treat of the snakes separately hereafter. The total number of human beings reported as killed by wild animals in 1886 was 2707. Some stress must be laid on the word *reported*, for it is very possible that many deaths occurred which were not reported to the police, through whose agency these statistics are collected; whilst, on the other hand,

it is suspected that some cases of murder are concealed—the cause of death or disappearance being attributed to wild beasts. The total number of cattle reported as killed by wild beasts in 1886 was 55,203; but this also gives a rather inadequate idea of the true mortality amongst tame animals; for, in the first place, many must be killed whilst grazing in the jungles, whose death the poor owner never reports to the police; and the return only includes cows and oxen, and buffaloes; whilst it is incidentally mentioned that nearly 8000 sheep and goats were killed in Madras, in addition to 10,000 head of cattle.

The following table exhibits the numbers of the human victims, according to several wild animals by which they were slain:—

Killed by Wild Elephants	-	-	-	-	57
„ Tigers	-	-	-	-	928
„ Leopards	-	-	-	-	194
„ Bears	-	-	-	-	113
„ Wolves	-	-	-	-	222
„ Hyænas	-	-	-	-	24
„ Other animals	-	-	-	-	1169
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					2707

The account *per contra*, showing the number of wild animals destroyed, and the amount of rewards paid for their destruction, stands as follows:—

	Number killed.	Rewards paid.
Wild Elephants	7	Rs. 300
Tigers	1464	„ 48,000
Leopards	4051	„ 70,632
Bears	1668	„ 7,783
Wolves	6725	„ 24,138
Hyænas	1650	„ 6,552
Other animals	6852	„ 6,033
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Total	22,417	Total 163,438

Thus it will be seen that, on the whole, the wild beasts had much the worst of the conflict. As between tigers and men, unfortunately, the numbers were more nearly equal; but on looking into the details from the different provinces, very remarkable differences appear. For instance, in Lower Bengal 780 persons were killed by tigers, but only 245 tigers were killed;

whereas, in the province of Assam 81 persons were killed by tigers, whilst 436 tigers were killed. Some provinces are almost free from tigers. In the Punjab only one man was killed by a tiger, and only four tigers were destroyed. In the province of Bombay only 8 persons were killed by tigers, though 97 tigers forfeited their lives. It will have been observed that 1169 of the deaths are attributed to other unspecified animals; whilst 6852 animals coming under this indefinite heading were killed. From some of the details which have been given, particularly in Bengal, it appears that Jackals take the highest place in this class, and it is probable that many more young children are carried off by Jackals than the returns show. A woman, whose hut is on the outskirts of a village surrounded by trees and low brushwood, may go over to a neighbour's house to borrow a little rice or some fire-wood. Her absence may be but for a minute, but when she returns, the little child that she left playing at her door has disappeared. No cry was heard, for the Jackal seized the child by the back of the neck, and death was instantaneous. The men of the village are away at their daily work in the fields, and before the afflicted woman can summon her neighbours to the rescue, every morsel of her missing child has been devoured by the Jackal and its hungry whelps.

With regard to the unspecified 6852 wild animals which killed 1169 persons, some almost comic particulars have been given in the reports of the different provinces. For instance, in Madras they include wild boars, bisons, mad jackals, and crocodiles. In Bombay the list embraces scorpions, mad dogs, mad camels, mad jackals, wild hogs, stray dogs, and bulls. In Bengal they consist of wild boars, buffaloes, crocodiles, mad dogs, sharks, moles, oxen, pigs, scorpions, wasps, and koias. We regret that we are not acquainted with the last-named animal, the koia; and it is rather a novelty to find wasps entered as wild beasts. The Mole was fatal to one of our greatest English monarchs, and therefore may have acquired high rank and dignity in the eyes of the educated native clerk by whom the return was most probably compiled; whilst the same authority professes to distinguish between Alligators and Crocodiles; and it is an addition to zoological knowledge when a Shark is classified as a wild beast. The statistical compiler has also noted a difference between wild boars, boars, and pigs.

The number of cattle killed by wild beasts in 1886 was 55,023. They were destroyed as follows:—

By Tigers	-	-	-	-	-	23,769
„ Leopards	-	-	-	-	-	22,275
„ Bears	-	-	-	-	-	758
„ Wolves	-	-	-	-	-	4,265
„ Hyænas	-	-	-	-	-	1,312
„ Other animals	-	-	-	-	-	2,644

As regards poisonous Snakes, it was hardly to be expected that among the Hindoos any systematic action should have been taken for their destruction. To the Hindoo the Snake is the representative of a deity. A native finding a Cobra in his house would be more disposed to propitiate it with a bowl of milk than to strike it with a stick. But the English Government of India has taken a different view of its duties as regards venomous Snakes. The deaths attributed to the bite of a Snake were so numerous that about thirty years ago, when Sir Frederick Halliday was Lieut.-Governor of Bengal, he first authorized the grant of a small reward for the dead body of every venomous Snake that was produced before the magistrate of a district. In some districts the proffered reward had but little effect; in others the pecuniary inducement was so tempting to the poorer classes that almost the whole community took to snake-hunting. They brought in the dead Snakes by thousands, so that the magistrate of one district complained that he could not carry on his ordinary duty on account of the stench from the putrid bodies. Finally, a financial difficulty arose, as the demands for the rewards were found to have exceeded the small sum which had been tentatively provided in the annual Budget estimates. So Lord Canning and his financial advisers decided that, having regard to the empty coffers of the public Treasury, it would be expedient to allow the Snakes to remain undisturbed in their natural haunts.

When the financial state of the country improved, the Supreme Government permitted some of the local administrators to resume the practice of offering rewards for killing venomous Snakes. The number of persons killed by Snakes in India is appalling. The returns for 1886 show that 22,134 human beings perished from snake-bite. On the other hand, the number of cattle killed by Snakes is returned at 2514. The serpent is therefore specially the mortal enemy of man in India; and

death from the bite of a Snake comes to be regarded as an ordinary incident in human life. The province of Bengal holds a bad pre-eminence in the bills of mortality from snake-bite, as the death of 10,388 persons, which is nearly half the total for the whole of India, is attributed to this cause. The figures are as follows :—

	Deaths.
Madras - - - - -	1,492
Bombay - - - - -	1,206
Bengal - - - - -	10,388
N.W. Provinces and Oude - -	6,538
Punjab - - - - -	984
Central Provinces - - - - -	869
Burmah - - - - -	182
Assam - - - - -	254

On the opposite side of the account, it is stated that 417,596 Snakes were destroyed, and that Rs. 25,360 were paid by Government as rewards for their destruction. But considerable inconsistency prevails in different provinces, both as to the diligence with which the Snakes are persecuted, and in the sums paid as rewards in killing them. In Madras only 255 Snakes were destroyed, and no rewards were paid. In Bombay they killed 266,921 Snakes, and paid rewards amounting to Rs. 6527 for them. In Bengal 31,284 Snakes were destroyed, and rewards of Rs. 3889 were paid. In the North-West Provinces and Oude the slaughter of 26,636 Snakes cost Rs. 3299, and in the Punjab 85,715 Snakes were destroyed at a cost of Rs. 10,506. In Burmah 2097 Snakes were killed, but only Rs. 3 were paid as rewards.

In Madras they lost 1492 lives from snake-bite; but they killed only 255 Snakes, and paid no rewards! In Bombay 1206 persons were bitten, and 266,921 Snakes were killed, and Rs. 6727 were paid in rewards. Yet in 1886 the rate of mortality from snake-bite was higher in Bombay than in Madras in 1885. In the Punjab the deaths from snake-bite increased from 686 in 1885 to 928 in 1886; but they killed 47,000 Snakes in the former year, and 85,000 in the latter year.

It certainly becomes rather difficult to say whether it is best to continue to give rewards for killing Snakes, or to revert to Lord Canning's policy of masterly non-interference, leaving the Snakes undisturbed in their natural haunts. It seems very

possible that, where the Snakes are systematically hunted and caught, some of their pursuers are fatally bitten; and, on the other hand, it has been officially suggested that when rewards are freely given for killing Snakes, some of the ingenious natives deliberately breed them, and live upon the profits derived from this new kind of stock. The number of cattle killed by Snakes is so small that some instruction is derivable from it. It is certain that cattle must be greatly exposed to attack from Snakes whilst grazing in the jungles: the Snakes doubtless avoid the cattle; and similarly any Snake will try to get out of a man's way if it can do so, with the exception of the *Ophiophagus*, who is credited with the habit of attacking men. The mortality from snake-bite in Bengal is also much larger among women than among men. They are usually bitten in the early morning, when they go out unseen before daylight, either to fetch wood from the faggot-stack, or for some other domestic purpose. During the rainy season, when nearly all the rice-fields are under water, the Snakes take refuge on the higher plots of ground on which the villages are built, and they hide themselves in the little wood-stacks and granaries in the courtyards of the houses; whilst, not unfrequently, they take up their abode in the house itself, where they are allowed to dwell with impunity, and sometimes fed with milk, until, on some unlucky day, the wife treads accidentally on the Snake in the dark, and it turns upon her and bites her. From the bite of a full-grown Cobra death ensues in a very few minutes; and the natives have no such remedies at hand as English science might use, but they put a vain faith in the fanciful charms and incantations recommended by their priests.

THE MANX SHEARWATER ON SKOMER ISLAND.

BY RICHARD M. BARRINGTON, M.A.

For over twenty years I have been visiting out-of-the-way islands on our western and southern coasts, from North Rona to St. Kilda, and thence southwards to the Skelligs and Blaskets: not merely flying visits, but living on them for days and weeks at a time in the height of the breeding-season. I have scarcely missed a year. Notwithstanding this I have been slow to record

my experiences in print. Wishing to examine the breeding-station of the Gannet at Grasholme Island, off the coast of Pembrokeshire, I pitched my tent on Skomer Island, towards the end of the first week in June last, about eight miles nearer shore, the position and appearance of which has been well described by the Rev. Murray A. Mathew in 'The Zoologist' for November, 1884. Not a Manx Shearwater was seen all day, except one or two which swept over the waves as we were crossing; but it is well known that owing to its crepuscular habits, the number seen in the daytime affords little indication of the proximity or otherwise of a breeding-station.

All went well until about 9.30 p.m. We were enjoying the quiet of the evening, watching the thousands of Puffins, in the midst of which we were camped, flying from the edges of the cliffs out to sea and back again. The island is about four miles round, I should say, and I think that of all I have ever visited, it would take first prize for Puffins, St. Kilda, where I stayed three weeks, being a good second. The boatmen had left us, but we were informed that numerous as were the Puffins, the Shearwaters on Skomer were still more abundant. I had a friend with me (V.), and we strolled along the cliffs for a walk; the ground (like all Puffin-breeding stations), was honeycombed with holes, and our feet went through every moment. "Do you hear that?" I said. "What?" said V. "Listen at this hole," I said. "Cuck-cuck-oo, cuck-cuck-oo, cuck-cuck-oo" (the "oo" was sounded like "oh," occasionally like "aw"). There was no mistake: it was a Manx Shearwater; the first we had heard. V. became excited and determined to get the bird. We rooted away with our hands at the bank for about two yards; the hole went gradually deeper, the Shearwater inside, at intervals of a minute or so, still crowing, "Cuck-cuck-oo." It seemed to be getting louder, and this gave us hopes of reaching the bird. Our hands were now quite tired, dirty, and the finger-nails broken with scraping. We got a huge piece of driftwood and prised up the soft bank, using a stone as a fulcrum. This brought us about four feet farther. Still the crowing continued, the noise outside apparently stimulating the Shearwater to louder efforts. V. now got an old crowbar, as the driftwood was rotten. This bar was used in connection with a hoisting-derrick on the edge of the cliff; we did not bring it with us. The bar

helped us about two yards farther, and V.'s enthusiasm was beginning to flag, but the defiant crows of the Shearwater inside urged him on, and he kept at it. We were both extremely warm (to use no stronger term), and rested ourselves for a moment, listening to the loud cries of the bird in the hole, which were more vigorous than ever, when we heard another close by. It was 10.15 p.m. We had been following the first Shearwater as if it was the only one in Skomer. "Try the second one," said I; "it may be easier to reach." Ere we could attempt anything we heard a third, a fourth, a fifth. In twenty minutes the whole ground seemed alive with them; Shearwaters crowed in every hole, where half-an-hour previously there was a dead silence, save occasionally the "oh" of a Puffin.

Presently the sounds, which were at first rather deep down, came nearer the entrances of the holes. It was quite dusk, yet we distinctly saw the white breasts and under parts of the Shearwaters as they fluttered out of the burrows. The crowing was no longer confined to underground regions; it soon began overhead, and the swift swerving flight of *Puffinus anglorum* crossed and recrossed our line of vision against the lighter parts of the sky. Now every hole seemed to deliver up its occupant, and as we went back to the tent, Shearwaters fluttered across the path in dozens, everywhere making for the edge of the cliff, or for some prominence from which they could rise. They were crowing all the time, those overhead as well as those in the holes. The air became alive with Shearwaters answering those underground, the rush of their wings as they sailed past with extraordinary swiftness would of itself have made a loud volume of sound, but when the night-air was filled with their cries in addition, it was indeed as if Bedlam were let loose. The note is always the same,—“cuck-cuck-oo,”—generally repeated three times, and with a varying degree of loudness and of harshness, or hoarseness, which is concentrated in the final “oo.” We lay down to sleep, but it was a mockery, for as the night wore on, the noise became worse and at times awful, and the maximum of intensity was reached about 11.30 p.m. The tent was on a slope about 150 feet over the sea, and though rather out of the track of the Shearwaters on their fluttering career downwards, they repeatedly banged themselves with all their

force against the sides. It was as if some one kept throwing clods of turf against the canvass.

Unable to sleep, we determined to go out, and either frighten or kill some of the Shearwaters. Armed with a stick each, we walked about two hundred yards, and caught or killed all we could carry—forty to fifty—in about half-an-hour. On the steep slope over the sea we had few chances, because the birds were quickly able to fly; but further up, amid the heath and bracken and on bare level places, the Shearwaters cannot rise, but flutter along the ground twenty, thirty, and even a hundred yards or still further, if there is no hillock from which they can rise, and here they could be knocked over with ease. Even on a moderate slope they cannot rise immediately, at all events they did not do so, and probably if a Manx Shearwater were placed on a level floor it might not be able to fly at all. Has any one tried the experiment? At all events facts are stubborn things, and in the dim light of a summer's night, on Skomer Island, in June this year, my friend and I caught or killed numbers of Manx Shearwaters, fluttering over level ground or down a moderate incline, quite unable to rise. Some of the Shearwaters actually crowed in my hand as I carried them to the tent by the legs. Our midnight raid had no effect whatever in quieting the birds, and we got no sleep until after two in the morning, when the noisy multitude began to enter their holes again, and after three not a crow of a Shearwater was heard until about ten the next night. It will thus be seen that in summer-time the great bulk of the Manx Shearwaters feed only five hours or thereabouts out of the twenty-four. They are seventeen hours in the holes, during which time one might travel all over Skomer Island and not see one, and very few were noticed in the daytime at sea.

I cannot agree with the Rev. Mr. Mathew, in describing the noise made by the Shearwaters as a "soft, weird, and unearthly chorus, though I have no doubt it "resembled nothing he had ever listened to before." If there was one attribute of the noise more striking than another, it was not only the want of softness, but the hoarseness, or harshness, of the final "oo," or "co," or "caw," sometimes shrieked desperately from the throats of the flying Shearwaters. In the holes, and at a distance, the noise appeared more subdued.

We stayed three or four nights on Skomer, which will ever be associated in my mind with the Manx Shearwater. As I have visited a great many islands, I venture to express an opinion that Skomer is the greatest British breeding-place of the Manx Shearwater, and, for its size, perhaps the greatest in Europe. The birds are not confined to the edge of the cliffs (indeed they rather avoid the extreme edge, which is mainly colonized by Puffins), but breed all over the island. The Puffins and Shearwaters constantly live in the same holes, but the Shearwaters seem to burrow deeper than the Puffins, and the Puffins do not breed so far inland. Skomer is largely devoted to rabbits, and the courteous and hospitable owner, Capt. Davies, complains bitterly of the injury done to him by the Shearwaters and Puffins. He states that they have become far more numerous since the passing of the Sea Birds Protection Act, and have driven away the rabbits, disturbing the does in the breeding-season. The Shearwaters he complains most of, because they breed everywhere, and take possession of the rabbit-holes in the very centre of the island. Captain Davies offered a small reward for their destruction one evening to his farm-boys, and he told me they brought him I think it was twenty-four dozen Shearwaters in a few hours, striking them with sticks as they fluttered along the ground attempting to fly. The eggs are so very deep in the holes they are difficult to obtain.

Mr. Dixon says the "Manx Shearwater is one of the commonest birds of St. Kilda"; but he was unable, he tells us, to land on "Soa, their great stronghold." owing to "the tremendous swell which was breaking over it." I visited Soa the year previous to Mr. Dixon's excursion to St. Kilda, and found it was a large island grazing one hundred and fifty to two hundred sheep, and more than one thousand feet high,—very unlikely to be covered with even a "tremendous swell,"—and I should say that the Shearwaters of Skomer Island are much more numerous. On some future occasion I may trouble you with a few notes on St. Kilda birds, as my experiences do not altogether coincide with those of Mr. Dixon. At present my subject is the Skomer Shearwaters, whose noise and numbers have made a vivid and lasting impression on me. Mr. Dixon's notes on the St. Kilda Shearwater will be found in 'The Ibis' for 1885, p. 94, and in Mr. Seebohm's 'British Birds,' vol. iii., p. 421.

ON THE HABITS OF THE MANX SHEARWATER.

BY THE REV. H. A. MACPHERSON, M.A.

CONSIDERING the attention paid of late years to the habits of British birds, it is surprising how many points of interest still require to be placed on a definite basis of ascertained truth. To no species will these words apply more forcibly than the Manx Shearwater (*Puffinus anglorum*). Colonies of this species were visited year after year, but ornithologists for the most part satisfied themselves with collecting specimens. The 'Transactions' of the Norfolk and Norwich Naturalists' Society have recently contained observations on the habits of this species by Mr. J. H. Gurney, jun., Mr. E. Bidwell, Mr. H. M. Wallis, and the writer; and these notes are offered as a further contribution to the literature of the subject.

A visit was paid, on July 4th of the present year, to the colony at Eigg, where an unknown Englishman had previously made havoc of the birds, in direct defiance of the wishes of the proprietor. Let us hope that the report current amongst the fishermen, that he had killed "half a hundred" nesting birds, was exaggerated. At any rate, the narrow track that winds along the grassy slopes on the north-east side of the island was followed on the morning in question, and not a few suitable spots were examined for the presence of Shearwaters. The first burrows approached were all untenanted, two or three holes usually occurring together. After an hour's search two burrows were explored side by side; each of these proved to contain a single bird engaged in incubating a chipped egg. Another burrow disclosed a fine old bird, which had evidently elected to spend the day underground. It appeared to be a male, being little worn in plumage, though the fact that some males share the labours of nidification was proved in 1885, when the writer dissected a male which had a bare hatching-spot. Another series of holes contained a solitary chick, and an old bird keeping company with a nestling about three days old. Several other holes proved to be occupied. All the nests contained fibres and the stems of grasses, evidently gathered close by. No burrow was more than a long arm's length in extent, and the majority ran from right to left. The soil was constantly light and dry.

On being dragged into broad daylight without ceremony, the

old birds cackled and scolded lustily, struggling vigorously to obtain their release. They used their bills also in defence, and inflicted some clean, incised cuts. The only bird that resigned itself placidly to its captors was the solitary male; doubtless the others felt that they were defending their eggs or young. When released on the grassy slopes, the birds fluttered downwards for many yards with expanded wings, and finally took flight about 100 ft. above the sea, all departing in a N.W. direction.

Remembering a former enquiry as to how this Shearwater progressed on *terra firma*, the writer was at pains to carry one of the birds to the most level strip of turf that could be found above the sea-shore. Liberated here, the bird was eager to escape, but ran with manifest discomfort; its legs appeared to be of little use, and progress was accomplished mainly by a vigorous flapping of the pinions.

One object of the ramble was to decide the downy plumage of the nestling. Specimens had previously been described from this colony of two varieties: (1), having a dark grey patch on the abdomen encircled by white; (2), having the abdomen pure white. This occasion furnished for comment specimens of the first variety, and also examples intermediate between the two, showing how the two forms merge almost imperceptibly one into the other.

Crossing from Eigg to Arisaig, on July 5th, only a string of from forty to fifty Shearwaters was observed. They flew to S.E., the wind blowing from N.E. On July 20th, Portree was left for Eigg; weather showery and wind again N.E.* No Shearwaters were seen until within a few miles of Arisaig, when a great number appeared. Sometimes a string of ten filed rapidly past, or five or six alighted together on the water. Their flight was occasionally in an extended line, but oftener in irregular files, and a right merry dance they led over the gloomy waters, which had lost the azure blueness of the previous day.

Several times the writer passed large flocks of Shearwaters mixed with Herring Gulls (*Larus argentatus*), the two species clustering together thickly on the waves, evidently feeding on shoals of fish. They thus brought to mind a problem which for some years had puzzled the observer. Some few dissections of adults and young birds had only shown that the œsophagus

* On July 20th the writer was accompanied by Mr. A. H. Macpherson.

usually contained clear and liquid oil. But on July 4th one of the breeding birds captured *in nido*, being stroked gently on the back, had belched forth a substance which an accomplished physiologist, Dr. Fletcher, who was present, pronounced to be without doubt the muscle of a species of fish in course of digestion. It was therefore gratifying to see, on July 20th, flocks of Shearwaters certainly feeding on surface fishes, especially as the writer had never before seen Gulls and Shearwaters congregating on the wing together. Dark spirits of the deep, as Shearwaters usually appear, while careering headlong over the waves, their sombre appearance on this occasion only served to create a lively contrast with the white heads and pearl-grey mantles of the adult Gulls. The Shearwaters did not linger very long upon the water, preferring to take restless flight hither and thither.

Despite their name, they do not literally "shear" the waves, but only top them very closely. Their flight generally consists of five or six quick beats, succeeded by a graceful gliding motion for a few yards. This is varied by many beautiful curvettes, none apparently executed at a greater elevation than forty feet above the sea, though the same birds ascend nearly a thousand feet in the gloaming, in order to reach such breeding-ledges as may happily lie outside the reach of the exacting British "tourist." On this occasion many Shearwaters were noticed until Eigg was approached; not more than half-a-dozen could be counted within a mile of the island.

Shaping a southward course past the Isle of Muck, many Shearwaters were again observed, and a little north of Ardnamurchan a dozen birds appeared close to the shore-line. As Ardnamurchan lights were neared, two or three Shearwaters were descried resting on the sea, somewhat in Gull fashion; the neck of the bird was bent slightly back, and the body floated buoyantly. Two flew past within a hundred yards of the lighthouse.

It is noteworthy that the Black Guillemot (*Uria grylle*), when disturbed, generally escapes with short flights; the Razorbill (*Alca torda*) sometimes takes wing, but more often dives out of harm's way; Guillemots (*Uria troile*) and Puffins (*Fratercula arctica*), if alarmed, usually duck abruptly under. Manx Shearwaters, though capable of diving strongly, usually shift their quarters by taking wing.

The foregoing remarks may serve to illustrate the facts that

(1), the colour of the downy young varies; (2), that these Shearwaters feed largely on shoals of fishes; (3), that they can associate with Gulls; (4), that during the day they forage many miles from their nesting-holes. It may be added that fine young birds and half-incubated eggs may be found in July in the same colony, suggesting that the birds do not all breed at the same time. Recent notes support the contention that the young of this Shearwater are white-breasted in first feather. Their capacity for existing many hours without food is very remarkable, though it is to be hoped that no modern naturalist would subject any birds of this species to treatment such as that accorded to the examples kept by Sir T. Browne, who, ceasing to supply them with fish, "found they lived sixteen days without taking anything" (Sir T. Browne's Works, ed. Bohn, vol. iii. p. 318).

BIRD PESTS OF THE FARM.

By H. H. SCOTT.

(Hipsburn, Lesbury, Northumberland).

SINCE I came to Northumberland, twenty-nine years ago, Rooks have much increased in the district—apparently trebled or quadrupled in numbers. They have altered to a considerable degree their mode of feeding. There is an antiquated belief that they live almost entirely on grubs and worms; but now the food of Rooks consists principally of cultivated crops. They first swallow as much as they can find of the seed which is put into the ground, and afterwards feed on the produce from such seed as at first escaped them. Corn of all kinds and potatoes are particularly liable to these depredations; and in regard to turnips, if the seed is so small that it is beyond their ability to gather it, still—as soon as the bulbs are well developed, especially Swedes—they are at work pecking holes in many more than they can eat, and many rot from the effects of rain and frost.

Rooks, having gradually increased beyond their natural food-supply, were driven to other expedients to supply the deficiency; and in addition to the farmers' crops, they found a convenient and palatable supplement in the eggs of other birds, and it is only twenty or thirty years since they became general stealers of eggs. To such an extent are these thefts now carried that during

nesting-time, in districts where there are large rookeries, the heather on the moors, and the fences in the fields are sought by Rooks, yard by yard, for the eggs of game-birds. In the district surrounding the Cheviots, where there are many rookeries, a nest overlooked is the exception. One shepherd told me, two years ago, that he knew of eight Grouse-nests, and only two had escaped. Meeting a head keeper on a large estate, a few weeks ago, I asked him how the Partridges were doing. His reply was, "He knew of dozens of nests, but scarcely one had escaped the Rooks." From what I have seen, and the evidence I have obtained, I am led to believe that not more than—if as many as—one-third of the game-nests escape their search. It has been remarked of late years that Grouse have decreased much in the districts mentioned, since such a small proportion of the eggs escape; and the Rook does not confine himself to eggs, for he takes the birds if he discovers them at a young and tender age.

How is it that the Rook has not been tried and condemned long since? Here are birds which do the farmer ten times as much harm as good, and destroy more game-birds than scores of poachers, yet nothing is done to stop their depredations, whilst much money is spent in providing keepers to preserve from human poachers. I would not by any means propose to exterminate Rooks; but it appears to me that if they were diminished to, say, one-sixth of their present number, it would only be reducing them to their normal number, and restoring the balance of nature, which having in times past (both as regards birds and beasts) been so materially disturbed by man, must continue in some degree to be regulated by him.

Next to the Rook in doing damage are House Sparrows, which are most injurious to fruit trees and bushes, by eating out the young buds; and in districts where they are numerous they are most destructive to corn crops as soon as the ears approach maturity. Like the Rook, they have increased enormously of late years, and it is absolutely necessary that, in their case also, something should be done to reduce them to their normal number.

Another pest of the farm is the Wood Pigeon, destructive to corn crops, turnips, and clovers. Only in some parts of the county do they appear in numbers, and when they do so, they are generally temporary visitors in severe weather from a more northern climate.

It is only by estimating closely the cost of the depredations of the birds I have mentioned, and adding thereto the expense of the bird-herds trying to scare them, that a farmer comes to have any precise idea of the loss he sustains. I have been trying to make these estimates for a few years, and my evidence is as follows:—Altogether I farm 700 acres of arable land in rotation. My costs and losses in connection with these birds amount annually to about £200; but, again, to avoid all contention, I will call it £150 per annum, and £150 on 700 acres is about 4s. 6d. per acre. As closely as I can reckon, the proportions of damage by the different kinds of birds were five-eighths by Rooks, two-eighths by Sparrows, and one-eighth by Wood Pigeons. I do not, however, say that every cultivator in the country suffers as much; but even, on the average, if the general losses are half,—*viz.* 2s. 3d. per acre,—they are about as much as the whole of the local rates paid for poor, schools, highways, and police, and all from a cause which might easily be removed by those directly interested. What a fuss ratepayers make about an addition of one penny to the income-tax or local rates, but here it is not pennies but shillings. Indeed I am convinced that these birds have had as much off the land for the last few years as has remained for profit to the men who farm it; for who amongst farmers has made more annual profit than 2s. 3d. per acre on the arable area occupied by him?

The thinning of Rooks appears to me easy of accomplishment, Sparrows not quite so easy, and Wood Pigeons more difficult, as the latter only breed in small numbers in this county.

I expect the majority, if not all those who are in the best position to form an opinion,—*viz.* landlords, tenants, game-keepers, and shepherds,—can corroborate me in what I have written; but I submit that much weight should not be attached to theories which may be advanced by those who are not directly interested, or who have not had an opportunity of getting instructed in natural science by practical observation.

Commenting upon this article, which we have abridged from a local newspaper, Mr. R. J. Graham Simmonds (Land Agent to Sir John Haggerston, Bart.) remarks that “It should open the eyes both of agriculturists and preservers of game to the mischief

going on continually around us in this respect, and the absolute waste of material and money which it involves. Whilst careful observers are almost unanimous in acknowledging the fact of the changes of habit in such birds as Rooks, the remedy for the evil has not been so far suggested. Years ago, no doubt, the Rook did a larger amount of good than harm, because the land was more full of grubs and vermin, which the Rook in those days fed upon chiefly; and also, the number of Rooks being smaller, there was enough and to spare for all, of the food they then principally enjoyed. Better farming, draining, and other improvements have altered the case now, and the land does not contain the same quantity of insect-life; whilst, on the other hand, the birds themselves have increased in numbers. Being obliged, therefore, to investigate the other sources of food-supply, they naturally take what comes first, and grain suffers, as Mr. Scott points out, both at sowing and reaping time. As regards their game-destroying propensities, there is no question about the enormous destruction to eggs from the common Rook. He is an egg-thief of the most wanton character, and may be seen beating a patch of grass or a hedgerow for nests like a terrier dog hunting for a rat. That this is sheer mischief, and not stress of hunger, is abundantly evident, as he will at such times abandon the grub and the worm for the greater delicacy of a nest of eggs, and once he finds them, there is hardly any limit to the number he will destroy. I have known one Rook take seventeen eggs from a game-nest, one by one, as deliberately as possible; and it is a fair argument that this bird would not have been a solitary instance at the time. That people either do not realize the existing state of things, or are led away by what was a truism years ago, but is so no longer,—that they ‘do more good than harm,’—is evident. What is the remedy—total annihilation? Certainly not. There is a medium course in everything, and what is wanted now, in the interest of farmers, as well as preservers of game, is that the relative proportion of such birds as Rooks to the amount of their natural food now existing on the land, should be restored. There is no necessity to destroy rookeries, which are a favourite feature of some old places; but there should certainly be a tacit understanding between all who own rookeries that they should be kept within limits. If, every May, the young Rooks were shot regularly, they would afford many a welcome pie to the cottagers in the locality, and the remaining birds would then not be too numerous.

and would find their legitimate food in sufficient quantity for their decreased numbers; they would then neither have to steal the farmers' grain, nor—having to search, as at present, long distances for food—take such pains to find out nests of eggs on moors and hedgerows."

Continuing the discussion, Mr. Gilbert Millar, head-keeper to Mr. Creswell, of Harehope Hall, Alnwick, writes:—"Seeing that no one has corroborated Mr. Scott's article on the destruction of game-eggs by Rooks, and as I have been a keeper on several large estates both in England and Scotland, perhaps a few remarks from me may not be out of place. Twenty-five or thirty years ago it was a very rare thing to know a Rook take eggs; but they have turned gradually worse every year since then, and now they have become a perfect pest and take all the early nests. Not one out of every twenty early nests that I have known of this last few years has escaped them; and until the vegetation gets up there is not any chance of escape. It is hardly possible to trap Carrion Crows now, as you are almost certain to get a Rook instead. I have never seen more Partridge nests in one season than I have this, but not one escaped of the first laying that I knew of. The result is that those that lay the second time do not lay so many eggs, and a larger proportion gets destroyed in the hay-cutting time, and thus affords little sport till October. Early Grouse-nests on outlying moors have the best chance to escape, as the Rooks, being then busy nesting themselves, do not travel so far as they do at other times; but whenever they are done nesting they spread out, seeking fresh feeding-ground. Some people think, because they see a Pheasant's nest in a rookery, that it is conclusive proof that Rooks do not take eggs; but they are safer there than outside, as the Rooks never seem to look for them under their own nests. Any good that a few people do trying to put them down is hardly known, and not until landed proprietors combine together to banish them from their rookeries will there be any change for the better. Those seasons they are banished from the rookeries they will do more damage on outlying grouse-moors than they do at present."

[We can fully confirm the statement that Rooks carry off Pheasants' eggs, and a note of our observations on this subject, communicated some years ago to Mr. W. B. Tegetmeier, was published by him in his work on 'Pheasants, for Coverts and Aviaries,' 1873.—ED.]

A VISIT TO THE BIRD ROCK ("CRAIG-Y-DERYN"),
TOWYN, NORTH WALES.

BY E. CAMBRIDGE PHILLIPS, F.L.S.

It was the 26th of July, in the Jubilee year; an accident had temporarily laid me up, but a fortnight at that healthy but quiet little village of Borth, Cardiganshire, with its comfortable hotel, and, best of all, its pure sea-breezes wafted straight over the Atlantic, had nearly made me all right again. Borth itself is singularly destitute of bird-life, the sea being usually very rough, and there is no feeding-ground—nothing but beautiful sands three miles in length. On our right we approach Ynyslas and the estuary of the Dovey, the muddy flats of which teem with shore-birds, and run nearly up to the prettily-situated town of Machynlleth. On the opposite side of the mouth of the estuary is Aberdovey, an excellent place for anyone wishing to explore that long extent of muddy flats I have before alluded to. Past the mouth of the Dovey, in Cardigan Bay, is Towyn, easily distinguishable from Borth, and as in the evening I could often see small strings of Cormorants, *Graculus carbo*, heading towards Towyn, and, on enquiry, finding they were returning to Craig-y-Deryn, their breeding-place, I determined to pay it a visit.

Starting by train from Borth, we ran along the estuary of the Dovey until we came to Aberdovey Junction. The tide being out, there were plenty of birds on the flats, principally Curlews, Gulls, and Plovers, the Black-headed Gull being especially numerous; and on nearing the Junction, a couple of Sheldrakes, with five or six little ones, were calmly waddling along the mud. Changing at Aberdovey Junction, and crossing the Dovey, a pleasant ride on the opposite, but more rocky, side of the estuary, past Aberdovey, landed us at last at Towyn, where, however, we were still a long way from the object of our journey.

Acting on advice given us before starting, we took the little slate-railway from Towyn to Abergynolwen, a distance of about five miles through most charming scenery, and on alighting at Abergynolwen we found some difficulty in getting a trap of any sort, but a few words in Welsh from my wife soon procured us an excellent tea in the small but clean village inn, and a capital

pony and trap, and at last we were nearing the Bird Rock. To anyone without nerves the drive would have been delightful, but with two wheels and a most dangerous road, after many twistings, I was thankful when we reached a large valley opening to the sea, at the mouth of which is Towyn, and turning to the left we pulled up close under a large rock, "Craig-y-Deryn" (the Bird Rock.) This rock stands boldly out, a most conspicuous object on the left-hand side of the valley looking down towards Towyn, and is precipitous on the two sides jutting out into the valley; but its top may be reached by walking over the hill from the valley behind it. These two sides, like a miniature Gibraltar, are nearly perpendicular, and it is on the ledges of the side facing towards Cader Idris that the Cormorant builds and rears its young in safety. The guide-books do not give the height of the rock, but I should say it would be about 400 feet, more or less. I know the Cormorants looked very small from where we stood. A road skirts the bottom, and the nests, with the young, for the most about three-parts grown, were easily distinguishable from the quantity of white droppings that fall beneath the nests and stain the surface of the rock.

We watched the old birds, particularly the hens, feeding their young, and the flight of the parent-birds as they circled and soared round the face of the rock, and particularly the powerful flight of the large dark cock birds, was grand in the extreme. The young, during the time they were being fed, made a continual querulous crying. Every now and then a Sparrowhawk would sweep round the face of the rock; instantly the old cock Cormorants would trumpet out their hoarse note of alarm and defiance, to be answered, in their turn, by the cries of the hens and young, making a babel of noise that must be heard to be understood. These sounds would ultimately die away, and perfect silence would reign until the appearance of another hawk would start afresh the trumpeting, and set the echoes replying. It was impossible for me to count the nests from where I was on the road, but at a rough guess I should say there were about thirty there then, but whether any young had flown I am unable to say.

The fishermen say that there are Cormorants on the rock blind from age, and that they never leave the rock, but are fed by the younger birds; but I am assured by a naturalist living at

Aberystwith who knows the rock well that he has many times seen it without a single Cormorant on it. They also say that the younger birds conduct the old blind birds to the sea, which I think is more likely to be true.

At the foot of the rock were two dead birds that seemed to have been shot when away, and to have flown home to die. There were also several small rabbits feeding directly under the rock, of which the Cormorants seemed to take no notice. The nests, as far as I could see, never seemed to contain more than three birds, and these must be able to fly well before they could get from the rock to reach the sea, about four miles off.

I watched the busy scene for more than an hour, and left about half-past six, when fresh arrivals kept coming in from the sea in little strings of four, five, and six. Instead of returning to Abergynolwyn we drove about two miles and a half down the valley towards Towyn, where we dismissed our driver, and walked the remaining distance into Towyn, which is the route I should advise any ornithologist visiting the rock to take. Charmed beyond measure at a sight which to me was so novel, I have here attempted to describe it.

NOTES AND QUERIES.

Death of Philip Henry Gosse, F.R.S.—We regret to have to record the death of Mr. P. H. Gosse, whose name amongst naturalists has long been a "household word"; for few men have done more than he has in the course of a long life to popularize the study of Zoology by means of his pleasantly written and often well illustrated works. Born at Worcester in 1810 he went in early life to reside at Poole, in Dorsetshire, and it was here he imbibed his taste for Natural History. Subsequently engaging in the mercantile profession, he visited Newfoundland on business in 1827, and remained there for eight years, during which time he found leisure to study the insects of that country and of Lower Canada, where he made an important collection. Travelling through the United States, he spent a year in Alabama, where he made a considerable number of drawings of insects, chiefly Lepidoptera. In 1840, having returned to England, he published his 'Canadian Naturalist,' but his love of travel could not keep him long in England; proceeding to Jamaica in 1844, he spent eighteen months in investigating the Natural History of that island, and making

collections there, which resulted in the publication of his 'Naturalist's Sojourn in Jamaica,' and his 'Birds of Jamaica,' with an atlas of coloured plates. Finally, settling down at Torquay, he devoted his attention almost entirely to the marine fauna, and the results of his research appeared from time to time in such works as his 'Naturalist's Ramble on the Devonshire Coast,' 'The Aquarium,' 'A Manual of Marine Zoology,' and 'Tenby, a Seaside Holiday.' His most important work doubtless was his 'Actinologia Britannica, a history of the British Sea Anemones and Corals,' which was finished in 1860; but this by no means concluded his literary labours, for besides the works above mentioned he produced a 'Natural History of Fishes,' a 'Text-book of Zoology for Schools,' a 'Manual of Marine Zoology,' 'The Romance of Natural History,' 'A Year at the Shore,' 'Evenings at the Microscope,' and some others; while the Royal Society's Catalogue of Scientific Papers to the end of 1873 includes some sixty separate memoirs from his busy pen. Amongst these should be specially mentioned two memoirs on the natural history of the Rotifera, contributed to the Transactions of the Royal Society, of which learned body he was elected a Fellow in 1856; his other papers being contributed to the 'Annals and Magazine of Natural History,' the 'Popular Science Review,' the 'Intellectual Observer,' and 'The Zoologist,' in which last-named periodical his earliest essays appeared. His latest work, undertaken in conjunction with Mr. C. T. Hudson, appeared in parts under the title of 'The Rotifera or Wheel Animalcules,' and formed, when completed in 1886, two goodly quarto volumes. Since that date, gradually failing health necessitated a rest from work until, on the 23rd of last month, he passed peacefully away, at St. Marychurch, Torquay, at the age of seventy-eight years. As an excellent out-door naturalist and an accurate reporter of what he had himself observed, Mr. Gosse, in his own line, was well nigh unsurpassed. To his teaching hundreds are indebted for their love for Natural History, and the cultivation of a taste which his agreeable writings did so much to encourage and enlighten.

Meeting of the British Association at Bath.—In Section D (Biology) the opening address was delivered by Mr. Thiselton-Dyer, C.M.G., F.R.S., President of the Section. It was devoted chiefly to a consideration of the present position and progress of Botany in this country, and will be found reported at length in 'Nature,' Sept. 13th. Mr. Dyer concludes thus:—
 "To sum up my argument. I believe I have shown you that at the bottom of every great branch of biological enquiry it has never been possible to neglect the study of plants; nay, more, that the study of plant-life has generally given the key to the true course of investigation. Whether you take the problems of geographical distribution, the most obscure points in the theory of organic evolution, or the innermost secrets of vital phenomena,

whether in health or disease, not to consider plants is, in the words of Mr. Darwin, 'a gigantic oversight, for these would simplify the problem.'"

Sir John Lubbock read a paper on "The Instincts of Solitary Wasps and Bees." Sir John remarked that the Hive Bee and the common Wasps were so familiar and so interesting that they had, to a great extent, diverted attention from the so-called solitary species of the same groups. Few, for instance, were aware that about 4500 species of wild Bees were known, and of Wasps 1100, of which 170 and 16 respectively lived in Britain. Their habits differed in almost every genus, and Sir John Lubbock referred to many which offered points of great interest. For instance, the *Anmophila*, having built her cell, placed in it, as food for her young, the full-grown caterpillar of a moth, *Noctua segetum*. Now if the caterpillar were uninjured it would struggle to escape, and almost inevitably destroy the egg; nor would it permit itself to be eaten. On the other hand, if it were killed, it would decay and soon become unfit for food. The Wasp, however, avoided both horns of this dilemma. Having found her prey, she pierced with her sting the membrane between the head and the first segment of the body, thus nearly disabling the caterpillar, and then proceeded to inflict eight more wounds between the following segments; lastly, crushing the head, and thus completely paralyzing her victim, but not actually killing it; so that it lay helpless and motionless, but though living, let them hope insensible. M. Fabre, to whom they were indebted for a most interesting series of essays on that group of insects, argued that that remarkable instinct could not have been gradually acquired. Sir John Lubbock had suggested in a previous paper in what manner, as he supposed, that habit might have been gradually acquired, and he was interested to find in Mr. Darwin's 'Life,' that he had, in correspondence with M. Fabre, made a very similar suggestion. M. Fabre questioned that, in his recent work, maintaining that it could not be true, because habits were invariable. Sir John replied to that, giving many instances in which habits had altered, and showing that several gradations existed between Wasps which killed and those which paralyzed their victims. Though differing in that and some other points from M. Fabre, he warmly commended his interesting book and ingenious researches. One of the most interesting points connected with the habits of the insects was that there seemed strong evidence that the mother could control the sex of the egg. In conclusion, Sir John mentioned with regret the death of a Queen Ant which had lived in one of his nests since 1874, and must therefore have been above fourteen years old—much the oldest insect on record.

Prof. Marsh contributed a paper on "The Restoration of *Brontops robustus* from the Miocene of America," in which he said the animal had not yet been found in Europe.

"Heredity in Cats with an extra number of toes" was the subject of an interesting address by Mr. E. B. Poulton.

Papers were also read by Dr. Gadow on "The nature of the Geological Terrain as an important factor in the Geographical Distribution of Animals," and by Mr. J. J. Lister on "The Natural History of Christmas Island."

On September 6th, Professor Newton, M.A., F.R.S., addressed the Section, "On the Irruption of Pallas's Sand Grouse, *Syrrhaptes paradoxus*." He began by referring to the fact that at Newcastle, twenty-five years before (almost to the very day), he made a communication to the Section with this same title, and then hazarded the statement that the irruption of 1863, with which he then dealt, would be repeated. Events, and especially those of the present year, have justified that anticipation. After briefly tracing the early history of, and pointing out the wonderful peculiarity of, this very singular form of bird, he recounted its various visitations to Europe. In 1859 it was observed at seven places—Vilna, Jutland, Holland, Norfolk, North Wales, Kent, and Perpignan in France. In 1863 was the former great irruption, which extended in the north to the Nord Fjord in Norway and to the Færoes, to Donegal in Ireland to the westward, and to the southward to Biscarolles in France and Rimini in Italy. In 1872 a flock was observed in two places—Beal in Northumberland and Girvan in Ayrshire. In 1876 birds were seen near Winterton in Norfolk, and near Modena in Italy (both in June), and in the county Kildare in Ireland (in October). The irruption of the present year had been on a scale at least as large as that of 1863, and it had occurred at least a month earlier. So far as information was at present received, it had not extended quite so far to the northward, the Hardanger Fjord in Norway being the furthest point, but it had reached further to the westward (Belmullet in the county Mayo), and much further to the southward—Orvieto in Italy and the Albufera of Valencia in Spain—its first appearance in that kingdom—but information of further extension in all three quarters might still be expected. It was shown on a map that all these visitations were essentially similar in direction, and all seemed to have the same "radiant point"—on which it was hoped that Russian observers might be able to throw some light. As to the causes of these wonderful movements, the author said it behoved us to be very cautious. For himself he was not inclined to accept the suggestion of their being due to any "convulsion of nature," as some supposed, but rather to stand by that which he had before made—namely, that the impulse came from a redundant population striving for the means of existence. Into the details of the present irruption there was no time to go, for there were observations by the hundred. As to the breeding of the bird in this country, a very unworthy trick had been attempted—perhaps in more than one instance—to pass off eggs of foreign origin as having been laid in England. However, the author said that two cases had

come to his knowledge, on authority that seemed to be satisfactory, in which eggs had been laid—both in the East Riding of York. He thought that if the birds had not been prevented, they might have produced young, which in their turn would have become regular visitants—but he never had any faith in the species becoming resident. In the course of the discussion which followed, Canon Tristram expressed his belief that the coast of Northumberland, which had been in three years visited by *Syrrhaptēs*, might prove a congenial home for a colony, and regretted that the bird was not more protected by law. Mr. Elwes doubted whether there was any tract of country east of the Volga that was suitable to the requirements of the bird; he thought that in Southern Russia it might establish itself and live for many years without being noticed. He also referred to his having obtained on the frontiers of Tibet four living examples of the larger species, *S. tibetanus*, which, however, soon succumbed apparently to climatic effects when brought into the lower country. Sir George Campbell was beginning to speak of Sand Grouse in India, when he was stopped by the Chairman (Dr. Selater), who pointed out that he was mistaken in supposing that any species of *Syrrhaptēs* inhabited that country. The usual vote of thanks to the author of the paper was passed. Through the kindness of that venerable naturalist, the Rev. Leonard Blomefield, specimens of *Syrrhaptēs paradoxus*, the property of Mrs. Mackay, of Bennett Street, Bath, were exhibited.

In a discussion on Coral-reefs between the Biological and Geological Sections, Mr. Thiselton-Dyer said it was a question which at the present moment was attracting the interest of both biologists and geologists. In consequence of the explorations of her Majesty's ship 'Challenger,' a series of facts were brought before the scientific world which, in some degree, made it extremely probable that Mr. Darwin's views did not form the only explanation to which these curious phenomena are susceptible. A distinguished individual had thought fit to bring before the scientific world the preposterous assertion that they were leagued together in a conspiracy of silence with the object of suppressing the progress of scientific truth. He thought he might claim that their minds were absolutely open, and that they attributed no weight to the authority of tradition, however eminent. The only thing they really wanted to know was what was the conclusion that commended itself to their minds with the greatest probability, and which was based on the largest number of ascertained facts.

MAMMALIA.

The Feral Deer of Barbuda.—The deer now running wild on Barbuda is the Fallow-deer, *Cervus dama*. Last month Captains Harding and Standish, of the East Yorkshire Regiment, visited Barbuda on a shooting

expedition, and on their return here supplied me with the following information. The only deer on the island of Barbuda is the Fallow. They were introduced from England by a member of the Codrington family. The natives talk of there being as many as five thousand deer on the island; but Capt. Standish considers this statement a great exaggeration, probably five hundred being nearer the mark. These gentlemen shot seven deer, but all the bucks had their horns in velvet, and too soft to be worth bringing away. The prevailing colour in the herds is dappled-dun, though the ordinary light-coloured type is common. These deer are hunted in the bush with small cur-dogs that run mute, and pick their way over leaves, dead branches, and other obstacles with the greatest caution; when close to the deer they drop noiselessly, and the sportsman has then to peer about through the bush until he can see the quarry.—H. W. FEILDEN (Barbados, August, 1888).

White Variety of the Mole.—I have been shown by Mr. Martin, gunsmith, Glasgow, a curious variety of the common Mole, which was taken at Gigha, on the Cantyre coast, on the 20th June last. Its nose is perfectly white, as are also its hind quarters, the rest of the body being of a decided orange tint, especially about the cheeks. This makes the third specimen of the kind I have been shown in Glasgow within eighteen months.—W. HANNAN WATSON (Secretary, Zoological Soc. of Glasgow).

Bottle-nose Whales on the Norfolk Coast.—On the 28th August last a female *Hyperoodon rostratum* came ashore on the Norfolk coast at Snettisham: it was alive when stranded, but near the dorsal fin was a large harpoon wound. Two days later a young individual of the same species was stranded at Heacham, the next parish to Snettisham; both were towed to Hunstanton, a watering-place close by, and there exhibited. The old female measured twenty-five feet in length, and the young one fourteen feet. This species has frequently been captured on the Norfolk coast, invariably in the autumn, on its southward migration, and generally, as in the present instance, accompanied by its young one; the adult male apparently follows some other time of migration, and has never been met with here. I am indebted to Mr. Hamon le Strange for the particulars of this occurrence.—T. SOUTHWELL (Norwich).

Decrease of Seals on the Coast of Greenland.—In a letter written on board the sealing-ship 'Jason' in Denmark Sound, Dr. Nansen draws attention to the scarcity of Seals on the coast of Greenland in recent years. Only ten years ago they were so plentiful and tame that thousands could be clubbed with the greatest ease, whereas now they have become scarce and shy. Dr. Nansen is of opinion that the ruthless persecution of these animals since 1876, when the first sealer appeared in Denmark Sound, has caused them to alter their habits. Formerly they were found on the

edge of the drift-ice, where they were safe from their only enemy, the Polar Bear, though falling an easy prey to the sealer. Now they gather on the ice close to the shore, whither vessels cannot penetrate, and where they are, at all events, safe from one enemy. This, says Dr. Nansen, was fully demonstrated on several occasions, particularly on July 2nd, when Seals were seen lying in thousands close under the shore to the north and north-east as far as the eye could reach from the mast-head. To the north especially, the ice was for miles one mass of dark animals. Dr. Nansen advocates a closer preservation of the Seals. This year the seal-fishery has proved a failure, and the sealers report that the ice-masses were enormous.—'Nature,' August 30th.

BIRDS.

Reported nesting of Pallas's Sand Grouse in Cumberland.—In our last number (p. 348), we mentioned the fact of our having seen two eggs of a Sand Grouse which were emphatically stated to have been taken near Carlisle in June last, and which, if the statement were true, could only have belonged to *Syrrhaptes paradoxus*. These two eggs, which struck us as being somewhat larger than one which was laid by a Sand Grouse in the Zoological Gardens some years ago, were nevertheless similar to it in shape and colour. They were offered for sale at Messrs. Stevens's Auction Rooms in August last, and the biddings not reaching the reserved price put upon them (which we understood to be £5) they were not sold. We are sorry to learn from our esteemed correspondent Mr. H. A. Macpherson that a gross imposition was attempted in this case, and not only were the eggs not found near Carlisle as alleged, and as the result of enquiry clearly proved, but they may have belonged to some other species of Sand Grouse which has never visited the British Islands. The name of the person who attempted this fraud upon unwary egg-collectors has not been disclosed to us, or we should not hesitate to make it known as a warning. As it is, we can only say that no reliance is to be placed upon the unconfirmed report to which we gave credence in our last number, and of which we became aware too late in the month to make enquiries before printing it. *Verbum sap.*

Pallas's Sand Grouse in Dorset.—As a supplement to my former note (p. 264) on the occurrence of this bird in Hampshire, I may mention that, as late as the end of June, or beginning of July, a flock of these birds frequented a sandy piece of heath land on the borders of Dorset, and several were killed and eaten. I saw the feathers of one or more of them, so there is no doubt about the species, and eggs are also said to have been taken in the same locality, but up to the present time I have been unable to verify this statement. I think it very possible, if not probable, that the birds in question were those seen by my friend (mentioned in my former note), as the two localities are but a few miles apart, and when he saw

them they were flying in a direct line to the locality in which they are said to have nested. A male bird of this species was also killed on the 18th of June last in a garden not far from Wimborne, but it was terribly mutilated. —G. B. CORBIN (Ringwood, Hants).

Reported occurrence of the Cream-coloured Courser in Lancashire.

—In the 'Birds of Lancashire' (p. 175), I stated that I had examined a Cream-coloured Courser which had been shot in this county, and it is with mingled grief and joy that I have to advise you, firstly, of an error in identification, and, secondly, of an addition to the British list. The bird in question, having come into the possession of Mr. W. H. Doeg, of Manchester, was submitted by him to Mr. Seebohm, and he has pronounced it to be the Sociable Lapwing, *Vanellus gregarius* (Pall.). With the twenty years' reputation of the specimen as a Courser, and being only able to look at it by candle-light in a crowded case, perhaps I may be forgiven for having been deceived by the superficial resemblance between the two, and for having attributed such discrepancies as I could perceive, to the vagaries of country bird-stuffing. However, the credit of the determination belongs entirely to the gentleman named; and possibly Mr. Seebohm, to whom I have sent all the information I could get, may refer to the matter more fully.—F. S. MITCHELL (Clitheroe).

Wood Pigeons in the London Parks.—I notice this year a great increase of the Wood Pigeon (*Columba palumbus*) in Hyde Park. I remember the first pair coming, five years ago. The male bird is now lame; his plumage is almost black from the London smoke. Recently I counted forty-seven, old and young, feeding on the lawn to the north of Rotten Row. No doubt some of the birds from St. James's Park and Buckingham Palace Gardens have also come, attracted by the maize which is daily put down by the gardener. I have watched early and late, but have never seen either the Stock Dove (*Columba ænas*) or the Turtle (*C. turtur*). It is remarkable that the Wood Pigeon, which is so shy in the country, should become so tame in London; one pair have reared two broods this season in the same nest close to "the Row." The young birds find their way readily to the food, though in the country they seem unable to shift for themselves, and if not fed by the parent birds, they frequently die. I have often found them starved to death, even near the stubbles in autumn. In the country the Wood Pigeon does not come much to feed; but in Suffolk, where the Turtle abounds, we get them regularly, and I have counted over thirty within twenty yards of the windows, feeding on white peas, of which they seem very fond, and some of them come from a wood three miles distant, morning and evening. The Turtle Dove generally arrives the last week in April, and does not come much to feed after the 1st of August, during which month the majority of these birds depart, although I have killed them

as late as the middle of September when partridge-shooting. A pair of Waterhens, by the Serpentine Dell, have reared two broods this summer; these birds generally leave the Dell as the autumn advances, and they, no doubt, are migrants. I notice that this bird is largely a night-feeder, during which time a very curious weird cry is kept up; one dark evening in August the place for many yards round seemed alive with them. I saw a Goldfinch the other morning, in the Dell, feeding on the seeds of *Rudbeckia Newmanni*, but it is possible that—being so tame and quite alone—it may have recently escaped from a cage.—W. H. TUCK (47, Cathcart Road, South Kensington).

Black Redstart nesting in Essex.—The Natural History Museum has recently received an interesting acquisition in the shape of an undoubted nest, with two eggs, of the Black Redstart, *Ruticilla tithys*, taken in Essex. This is the first authentic instance, I believe, which has been recorded of this bird breeding in England. The nest referred to was presented by the Hon. Mrs. Ronald Campbell, who found it at Danbury Palace, Chelmsford, the seat of her father, the Bishop of St. Albans. She describes the circumstances of this interesting discovery as follows:—"The nest was in a hole in an ivy-covered oak-tree, which is more like a wall than a tree, and stands a few yards from a dairy in a dark sheltered corner. It was about four or five feet from the ground, and there were four eggs in it. The nest was found by some village boys who come to the dairy for milk, and their constant passing close to the nest must have caused the bird to forsake it. They showed it to my boys, and we watched it carefully, and saw the bird fly off twice—a dark-coloured bird with a red tail. This first made me think it was a Redstart, as they abound about here, but I could not understand the white eggs. They were a delicate pinkish white before being blown, like pink pearls. The nest was built early in May. . . . I am sorry one of the eggs was accidentally cracked. The other two were the same size as the cracked one. One of them was broken in the nest when we first saw it, and the other was given by my boys to a friend who had a good collection." The egg which is not cracked is considerably smaller than the injured one, which, as stated above, was the same size as the twoothers. I hope to have the pleasure of exhibiting this most interesting nest and eggs at the next meeting of the Zoological Society.—W. R. OGILVIE GRANT (Natural History Museum, South Kensington).

The Raven in Dorsetshire.—A friend of mine, Commander J. B. Young, R.N., writes me the following interesting account of a pair of Ravens which nested this year on the west cliffs of Portland. The first nest was in a cave about five feet square entrance, and about thirty-five feet down a perpendicular cliff, and contained six incubated eggs on the 13th March last, which were taken. The second nest was about 500 yards

from the first, and placed on a ledge overhung by a portion of the cliff, and some fifty or sixty feet from the summit. This nest contained six fresh eggs, which were taken on March 29th. The birds then returned to the first nest, and laid two more eggs, which were also taken—cruel to relate—on April 11th. I do not think they laid again, but am not sure, as the cliff was not revisited by my friend after the third nest was robbed.—E. A. BUTLER, Lieut.-Col.

[The Raven is now so rare a bird in the South of England that it is deplorable to hear of such persecution as that above reported. Surely one "clutch" of eggs ought to have satisfied the collector!—ED.]

Hawfinch nesting in Norfolk.—I found a Hawfinch's nest in my garden, on the 18th May, containing five fresh eggs. It was built on one of the outside boughs of a tall cedar, about eighteen feet from the ground, and composed of dead sticks, lined with fibrous roots, with white lichen round the edge and on the outside of the nest. Old birds are very shy and seldom seen, although the tree was on the lawn, close to the house, and within a few yards of my window. I heard of three other nests this year near Lynn, one of which was low down on an elder-bush, nine feet from the ground, the other two about twenty feet. Another nest was taken at Aldeby, near Beccles, by a son of Col. Freeland.—E. A. BUTLER, Lieut.-Col.

Red-breasted Flycatcher in Ireland.—A specimen of *Muscicapa parva* was killed by striking against the lantern of the Arklow (South) Lightship, seven miles from shore, on October 23rd, 1887, and was forwarded to me in a semi-decomposed condition. Only the head, wings, legs, and tail could be saved. The entry in the schedule for October 23rd is as follows:—"Several small birds from 7 p.m. to 5 a.m. about lantern; wind W.S.W., fresh, gloomy. Several killed and fell overboard. Two sent by post." The two birds sent by the mate of the lightship (Mr. A. B. Wall) were a Red-breasted Flycatcher (which is labelled "name unknown") and a Black Redstart, which struck the lantern at 3 a.m. Prof. Newton and Mr. Howard Saunders have both seen this specimen, in which the essential characters of *Muscicapa parva* are well shown, and agree in the determination of the species. With the exception of one killed at Berwick-on-Tweed, on Oct. 5th, 1883, this species does not seem to have been recorded from any portion of the British Isles during the last five-and-twenty years, since three were obtained in Cornwall and Scilly in 1863 and 1865, in the months of January, October, and November respectively.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

Pied Flycatcher in Ireland.—Referring to my friend Mr. Warren's note (p. 267), I may remark that the Pied Flycatcher has occurred on two occasions at Irish light-stations. I possess a wing and leg of one taken at 8 p.m. on Sept. 21st, 1886, at the Tearaght Rock Light. This rock is

very wild, 600 feet high, and nine miles off the coast of Kerry, the most westerly land in Britain. I have another leg and wing from the Fastnet Rock, seven miles south of Co. Cork. This bird was killed by striking against the lantern at 4 a.m. on October 5th, 1886. The remarkable thing is that the Pied Flycatcher has not been met with in Ireland except at light-stations, if we except Mr. Warren's specimen killed in April, 1875, in Mayo. The light-keepers do not know the bird, and sent the specimens in accordance with instructions printed on the migration schedules. These instructions, as to legs, wings, &c., were first generally complied with in 1886.—RICHARD M. BARRINGTON (Fassaroe, Bray, Co. Wicklow).

Dipper nesting in a Tree.—In the last two numbers of 'The Zoologist' mention is made of this bird nesting in a tree, and as it seems to be of rather rare occurrence perhaps the following may be of interest:—In April, 1885, when salmon-fishing on the Dee, near Banchory, Aberdeenshire, I saw a Dipper fly into a large bunch of grass which was hanging from a branch about four feet above the river. This bunch of grass had been left there when the river had been in flood: the branch had dragged on the top of the water, and collected grass and other things brought down, and when the water fell, it was left in a large bunch high and dry. Seeing the bird go in many times, I sent my gillie, who in the centre found a nest, with four eggs, which he brought me: it was lined with brown leaves of beech.—J. WHITAKER (Rainworth, Notts).

Manx Shearwater near Croydon.—On September 6th a Manx Shearwater was flying over Haling Park, Croydon, mobbed by Swallows. A man saw it fly against a tree and fall in a stunned or exhausted state; he picked it up and took it to Thorpe, a taxidermist here, who kept it alive for a day or two, but as he could not make it eat anything he killed and preserved it.—PHILIP CROWLEY (Waddon House, Croydon).

Nesting of the Peregrine and Kestrel.—Has anyone ever seen either of these species carrying material to build a nest, or (if their eggs have been found in a nest) has it been anything more than the deserted nest of another bird? I am led to this enquiry by seeing in 'Birdsnesting,' by Miller Christy (1888), that the materials used by the Peregrine are "Sticks, sea-weed, dry grass, and other vegetable substances," and that those used by the Kestrel are "Sticks, dry grass, and wool." Similar statements have been made by previous writers, and by some of high authority. My experience of the breeding habits of the Peregrine extends over six seasons, and I have annually descended to several eyries of this species, numbering eleven in 1888; and I have been familiar with the habits of the Kestrel since I was a boy. I once took some Peregrine's eggs from the deserted nest of a Raven; and Mr. A. W. Johnson, of Newcastle, tells me of a similar instance that occurred this year. With these two exceptions, I have

always known the Peregrine to lay in a little hollow scraped by her in the earth on her breeding-shelf in the cliffs, which earth sometimes is mixed with a quantity of the bones left by her when rearing former broods. I have always found the Kestrel, when breeding in cliffs, act in a similar manner. I saw the eggs of a Kestrel in a deserted nest of a Hooded Crow in the sea-cliffs this year; but otherwise have always found them on earth upon a ledge, or in a recess of the cliffs, or in the deserted nest of a Magpie or Crow when in a tree, without any addition having been made by the Kestrel. That either species should bring materials to construct a nest, or to add to a deserted nest, is so contrary to my experience that the oft-repeated statements to that effect seem to require thorough investigation. In forest regions, like Pomerania, the Peregrine is stated to breed in trees; but has anyone known this bird to *build*, or does she merely lay her eggs in the deserted nest of some other bird? Mr. Christy also enumerates "wool and dry grass" among the building-materials of the Heron. Who has seen this? Has it simply been copied from the earlier editions of "Yarrell"? Did Mr. Yarrell ever climb to a Heron's nest? I have found nothing but sticks, lined with twigs, and sometimes a few coarse stems, such as bracken?—R. J. USSHER (Cappagh, Co. Waterford).

[The Editor once climbed to the nest of a Heron in Wanstead Park, Essex. It was situated on the top of an elm, and was composed of large twigs, principally elm and willow, and lined with smaller twigs, fibre, and dry grass.]

Stock Dove laying three Eggs.—The normal number of eggs laid at one time by Pigeons is well known to be two, and instances in which more than two are laid in a nest by the same bird are probably rare. On the 21st April last, I found a nest, in an ivy-covered thorn, containing three fresh eggs, all apparently laid by the same bird, as only one pair were seen in the vicinity, and the hen bird was on the nest.—E. A. BUTLER, Lieut.-Col.

Golden Oriole at Harrow.—A Golden Oriole was, I am sorry to say, shot in the garden of the Park, Harrow, in May last. It is now in the Harrow School Museum. This year a Kestrel's nest was obtained not far from Harrow; this is a rather uncommon nest to find in that locality.—G. BARRETT-HAMILTON (Kilmanock, New Ross, Co. Wexford).

Cirl Bunting in Hampshire.—On the 20th June last I took a Cirl Bunting's nest, containing four eggs, in a hedge not a hundred yards from Queenwood College. They are very typical specimens of the eggs of this species. On the previous day I had obtained four more eggs of the Cirl at a cottage about a mile off. Three others, in a collection of one of the pupils here, were bought from some country boy near here. Until last year, when my son took a nest with three eggs, I had not come across the Cirl Bunting in this neighbourhood. It is evidently not common, or with the

zeal shown amongst the pupils in egg-collecting more specimens would doubtless have been obtained.—JOHN H. WILLMORE (Queenwood College, Stockbridge, Hants).

Honey Buzzard in Staffordshire.—A fine specimen of the Honey Buzzard, *Pernis apivorus*, was shot in the Marquis of Anglesea's park at Beau-Desert, Rugeley, Staffordshire, on the 27th July. It is a rare visitor to the Midland Counties.—J. S. ELLIOTT (Bourne Street, Dudley).

REPTILES.

Palmated Newt in Carnarvonshire.—In June, 1887, I found this species in some numbers in two shallow pools of water at the top of the cliffs in Porth Ceiriad, a small bay about eight miles S.W. of Pullheli; and on the 24th of May last I took the specimens sent herewith, at the same place. So far as I know, *Molge palmata* has not been recorded previously for any county in Wales.—CHAS. OLDHAM (Ashton-on-Mersey).

FISHES.

The Twaite Shad on the Cornish Coast.—A specimen of the Twaite Shad, *Clupea finta*, was taken in a draw-seine off St. Michael's Mount, on the 25th August last. The fish is rare in our waters (much rarer than its congener the Alice Shad, *Clupea alosa*), and therefore I note it. This specimen weighed five pounds twelve ounces, and is set up for the collection of Lord St. Levan at the Mount.—THOMAS CORNISH (Penzance).

[According to R. Couch, the Twaite Shad is found in the west of Cornwall in rather large numbers towards the latter part of the summer Pilchard fishery, and early in the autumn Mackerel fishery, and is frequently taken in Mackerel drift-nets off Scilly, moving E. or N.E.—ED.]

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 5, 1888.—Dr. D. SHARP, F.L.S., President, in the chair.

Mr. M. Stanger Higgs, of St. Leonard's, Gloucester, was elected a Fellow of the Society.

Dr. Sharp mentioned that he had received, through Prof. Newton, a collection of Coleoptera from St. Kilda, consisting of *Carabus catenulatus* (1), *Nebria brevicollis* (12), *N. gyllenhalii* (3), *Calathus cisteloides* (20), *Pristonychus terricola* (1), *Pterostichus nigrita* (71), *Pt. niger* (31), *Amara aulica* (4), *Ocypus olens* (1). The species being nearly all large Geodephaga,

he thought probably that many other Coleoptera inhabited the island. He remarked that these specimens showed no signs of depauperation, but were scarcely distinguishable from ordinary English specimens.

Mr. South exhibited a melanic *Aplecta nebulosa* from Rotherham, bred with five others of ordinary form, and an albino of the same species from Devonshire; a very curious dark variety of *Plusia gamma*; two dark *vars.* of *Eubolia limitata* from Durham; *Dicrorhampha consortana* from North Devon.

Mr. Champion exhibited *Harpalus cupreus*, *Leptusa testacea*, and *Cathormiocerus maritimus* from Sandown, Isle of Wight.

Mr. Elisha exhibited the following Micro-Lepidoptera; — *Æneana*, *atricapitana*, *turionana*, *juliana*, *derasana*, *capreana*, *pomonana*, off *Sorbus aucuparia*; *sodaliana*, *zephyrana*, *trigeminana*; also *Schiffermulleriella*, *horridella*, *alpella*, *fuscoarella*, *therinella*, and *semidecandrella*, on *Cerastium tetrandrum*.

Mr. Jacoby exhibited three boxes of Coleoptera, collected partly by Mr. Fruhstroffer, containing some rare *Cetoniidæ*, *Paussidæ*, &c.

Mr. E. Saunders exhibited *Amblytylus delicatus*, Perr., a new British bug, taken at Woking.

Mr. Jacoby mentioned that he had taken the larva of *Vanessa cardui* on a narrow white-leaved plant in his garden.

Mr. Enock mentioned that out of a batch of two males and six females of the Hessian Fly kept together, all six females had laid fertile eggs, so that each male must have impregnated more than one female.

NOTICES OF NEW BOOKS.

The Fauna of British India, including Ceylon and Burma.
Mammalia (Part I.). By W. T. BLANFORD, F.R.S. 8vo,
pp. 250. London: Taylor & Francis. 1888.

So long ago as 1883 the Secretary of State for India in Council, upon the recommendation of the Government of India, gave his sanction to the publication of a series of volumes on the Fauna of British India. Such a work is now seriously needed, for it cannot be said that the publications of Jerdon, Blyth, Hume, Legge, Günther, and Day, excellent as they are in their way, adequately represent or embody anything like the information which is now available on the subjects upon which they treat. None of them can be called recent publications, and

some of them have been printed more than twenty years. It is quite time therefore that an attempt should be made to bring together, with the aid of specialists, the best and latest information which can be collected—building up, as it were, a more modern structure upon the good foundations already laid by the authors above mentioned. The task is by no means a light one, for the amount of available materials is now very considerable, and it will require the exercise of much skill and judgment to bring together in a condensed and convenient form just such information as is most desired by students of Zoology at the present day.

In entrusting the general editorship of these volumes to Mr. Blanford, it will be generally conceded by those best qualified to express an opinion that a wise selection has been made. Mr. Blanford's long residence in India, where his work on the geological survey afforded him constant opportunity of studying the fauna of the country, his thorough acquaintance with the works of his predecessors in the same field, and his well-known ability as a practical zoologist, combine to fit him admirably for the post; and we cannot doubt that, under his editorship, the scheme will be successfully carried out.

To save time, as well as to ensure the best possible results, the principle of a division of labour will be adopted, and different specialists will undertake different parts of the work. For the present it is proposed to restrict the publication to the *Vertebrata*, and to complete the work in seven volumes of about 500 pages each; the Mammals (one vol.) being undertaken by Mr. Blanford himself; the Birds (three vols.) by Mr. E. W. Oates, author of the 'Birds of Burma'; the Reptiles and Batrachians (one vol.) by Mr. Boulenger; and the Fishes (two vols.) by Dr. Day, who has already bestowed considerable attention on the subject in his work on the 'Fishes of India,' which may doubtless serve as a groundwork, with necessary modifications and additions.

The first instalment of this important work is now before us in the shape of the first half of Mr. Blanford's volume on the Mammalia, and augurs well for what is to come.

Adopting the classification proposed by Prof. Flower (Proc. Zool. Soc. 1883, pp. 178—186), as "the best hitherto published," the descriptions of genera and species, as well as the measurements, have been taken from specimens whenever possible, and

in the few cases in which specimens were not available, the characters have been copied from descriptions by previous writers. The notes on distribution and habits have been compiled from various writers, especially from the works of Jerdon, Blyth, Hodgson, Elliot, Kelaart, Tickell, Sterndale, M'Master, Forsyth, Sanderson, and others, supplemented by the Editor's own observations made during a sojourn of more than twenty years in India.

The result is that we have an excellent digest of all that is important in regard to the better-known mammals of India, while, as regards the rarer species, seldom met with, and difficult to procure, we are furnished with transcripts of the original descriptions, with references to such supplementary information as has since been published concerning them.

Referring to the present distribution of the Lion in India, Mr. Blanford says (p. 57):—

“In India the Lion is verging on extinction. There are probably a very few still living in the wild tract known as the Gir in Kattywar, and a few more in the wildest parts of Rajputana, especially Southern Jodhpur, in Oodeypur, and around Mount Abu. About twenty years ago Lions were common near Mount Abu, several were shot near Gwalior, Goona, and Kota, and a few still existed near Lalitpur, between Saugor and Jhansi. One is said to have been killed near Goona in 1873. In 1864 one was killed near Sheorajpur, twenty-five miles west of Allahabad; and when the railway was being made from Allahabad to Jubbulpoor in 1866, a fine Lion with a good mane was shot by two of the engineers near the eightieth milestone from Allahabad. About 1830 Lions were common near Ahmedabad. Several years previously, in the early part of the century, Lions were found in Hurriana to the northward, and in Khandesh to the south, in many places in Rajputana (one was shot in 1810 within forty miles of Kot Deji in Sind), and eastward as far as Rewah and Palamow. It is probable that this animal was formerly generally distributed in North-western and Central India. I have never heard of Lions in Cutch, and suspect Jerdon was mistaken in supposing them to be found there. Eastward and northward of India the Lion is not found, and almost the only part of Western Asia in which it is common is in Mesopotamia and part of South-western Persia.”

Mr. Blanford is of opinion that there is only one species of Lion common to Asia and Africa, regarding the so-called “maneless Lion of Guzerat” as merely a variety, and described from an immature example.

Comparing the Lion and Tiger, he says :—

"Lions are perhaps bolder than Tigers, and certainly much more noisy, their habit of roaring, especially in the evening and at night, having necessarily attracted the attention of all who have been in countries infested by them. Of the two, the Tiger, though standing lower, is heavier in the body, and I think the more powerful animal."

The dimensions of a full-grown Lion are given as "head and body, $5\frac{1}{2}$ to $6\frac{1}{2}$ ft. long; tail, $2\frac{1}{2}$ to 3 ft.; the female considerably smaller." The dimensions of an adult Tiger are almost identical.

The usual measurement of Tigers by sportsmen is from the nose over the curves of the head and back and along the tail to the tip. Thus measured, says Mr. Blanford, full-grown Tigers are generally 9 to 10 feet long, Tigresses 8 to 9; but Tigers have been killed which measured as much as 12 feet in length.

The present distribution of the Tiger is described as "throughout India, Burma, and other parts of South-eastern Asia, Java, and Sumatra, but not in Ceylon, nor, it is said, in Borneo. It occurs in suitable localities throughout a great part of Central Asia, and is found in the Valley of the Amur, the Altai Mountains, around Lob Nor in Eastern Turkestan, about the Sea of Aral, on the Murghab near Herat, on the southern coast of the Caspian (Hyrcania), and in the Caucasus, but not in Thibet, Afghanistan, Beluchistan, or Persia, south of Elburz Mountains on the Caspian."

With regard to Afghanistan, we believe, Mr. Blanford is mistaken; for, if we are correctly informed, Dr. Aitcheson sent home from that country to the Zoological Gardens, a Tiger-cub, which he had secured there rather more than a year ago.

There is still much to be ascertained about the geographical distribution of Indian Mammals. The Cheetah, or Hunting Leopard, according to Jerdon, is not found in Ceylon, but how far south it ranges in India has not been precisely ascertained. Mr. Blanford thinks its range is probably the same as that of the Indian Antelope, upon which it preys. In capturing this fleet animal its habit is to stalk up to within a moderate distance of between 100 to 200 yards, taking advantage of any cover that will conceal it, and then to make a rush. Its speed for a short distance is remarkable, far exceeding that of any other beast of prey, even of a Greyhound or Kangaroo-hound, for no dog can at first overtake an Indian Antelope or a Gazelle, either of which

is quickly run down by the Cheetah if the start does not exceed about 200 yards. M'Master saw a very fine Hunting Leopard catch a Blackbuck (*Antelope cervicapra*) that had about that start, within 400 yards. It is probable, says Mr. Blanford, that for a short distance the Hunting Leopard is the swiftest of all mammals.

This swiftness, coupled with its docility, has led to its being tamed and trained for the chase by native sportsmen; but, contrary to what would be supposed, only adults are captured, Indian shikaris considering that the young can only be properly trained by the parents.

By many writers, and amongst Indian naturalists by Sykes, Elliot, Horsfield, Hodgson, and Sterndale, it has been thought that, besides the Cheetah, there are two species of Indian Leopard, a larger and a smaller. Even Jerdon appears to have been in doubt on the subject. Mr. Blanford suspects that the supposed difference is very often due to age, and states that he has for years endeavoured to distinguish the two forms, but without success.

Much has been written about the combats between the Mongoose* (*Herpestes mungo*) and venomous snakes, and the supposed immunity of the former from snake-bite. The prevalent belief throughout Oriental countries is that the Mongoose when bitten seeks for an antidote—a herb or a root known in India as *manguswail*. The story, however, is without foundation, though there is some evidence to support the impression that the Mongoose is less susceptible to snake-poison than other animals. Upon this point Mr. Blanford agrees with Jerdon and Sterndale, that “the Mongoose usually escapes being bitten by his wonderful activity. He waits until the snake makes a dart at him, and then suddenly pounces on the reptile’s head, and crunches it to pieces.” He adds, “I have seen a Mongoose eat up the head and poison-glands of a large Cobra, so the poison must be harmless to the mucous membrane. When excited it erects its long stiff hairs, and it must be very difficult for a snake to drive its fangs through this, and through the thick skin which all kinds of *Herpestes* possess. It has been repeatedly proved by experiment that a Mongoose can be killed like any other animal, if

* A corruption of “Mangus,” the native name for this animal in the Deccan and Southern India.

properly bitten by a venomous snake, though even in this case the effects appear to be produced after a longer period than with other mammals of the same size."

The Mongoose is an excellent rat-killer, and it is stated (Proc. Zool. Soc. 1882, p. 712) that within the last fifteen years the introduction of this animal into Jamaica has resulted in a saving of from £100,000 to £150,000 annually, owing to the decreased number of rats which destroy the sugar-canes.

We have been interested to learn what Mr. Blanford has to say about the so-called "Wild Dogs" belonging to the genus *Cyon*, and upon the question whether there is more than one species. Upon this point much difference of opinion has been expressed, and notwithstanding that Blyth, Jerdon, Murie, and others have opined that there is only one species existing throughout the Oriental Region, Mr. Blanford inclines to the view that two distinguishable forms inhabit the area, the fauna, of which he is investigating, and of these two forms *Cyon dukhunensis* and *C. rutilans*, he gives the specific characters.

The term "wild dog," he says, applied to these animals, is clearly a misnomer, for in every important detail in which the genus *Cyon* differs from *Canis* (Wolves and Jackals)—in the form of the skull, the dentition, and the number of mammæ—domestic dogs agree with the latter and not with the former. The name has doubtless been applied to the present genus on account of its hunting in packs, like hounds, its fine handsome and bold appearance, and its courage.

We have not space to say more on this first instalment of what promises to be a most valuable work on the fauna of British India. So far as his own share of the work is concerned, he has spared no pains to bring together the most reliable information that can be procured respecting every species to be included, while in regard to those classes of Vertebrates with which he himself is not so familiar, he has secured the co-operation of specialists whose names sufficiently guarantee the excellence of the contributions they have promised.

The numerous woodcuts with which the text is interspersed will materially assist the student in acquainting himself with the generic and specific characters.

